Scientific Writing between Tabloid Storytelling, Arcane Formulaic Hermetism, and Narrative Knowledge

Michael Böhler, University of Zurich

Abstract

The present discussion contribution argues that O. Müller not only suppresses Goethe's declared intentions with regard to the latter's Theory of Colors and ignores his place in what in any case is a different scientific culture than his (Müller's) own or Newton's, namely a premodern culture of "narrative knowledge" in the sense specified by Lyotard. Moreover, Müller entangles himself in the paradox of wanting on the one hand to back up Goethe on the level of fact when the latter opposes the militant selfrighteousness of the Newtonian school, but doing so on the other hand by constructing an epic-heroic narrative of Newtonian militance, not to say eristic belligerence contradictory to Goethe's own "tolerant enlightenment" in Lakatos' sense. Thus, we are confronted with one of those cases where, as Paul de Man puts it, a multidimensional critical reading on the semiological as well as rhetorical levels shows "that the text does not practice what it preaches" (de Man 1979, 15).

Opening Remarks

Scientists are also narrators. Not even scientific accounts subject to the strictest standards of objectivity can completely escape narrative elements. The only question is: What are the actual borders between scientific report and storytelling? Where and when does objective reportage cease to be such and storytelling, with all its ambiguity between fact and fiction (or faction), begins? And finally: At what point do narrative elements begin to infringe upon scientific and scholarly standards? Meanwhile, in the two areas of the cultural and social sciences on the one hand (Brown 1998; Geiger 2005; Klausnitzer 2008; Köppe 2011; Nünning 2012; Strohmaier 2013; Blume et al. 2015) and the natural sciences on the other (Avraamidou & Osborne 2008; Krzywinski et al. 2013; Katz 2013; Dahlstrom 2014; Downs 2014), the question of the relationship between knowledge, science, and narrativity has been receiving increased attention. Thus the National Academy of Sciences in the USA has held two colloquia, in 2012 and 2013, on the theme "The Science of Science Communication" (Fischhoff & Scheufele 2014), in which the advantages and dangers of narrative elements were one of the leading issues. And, in 2013, the World Conference of Science Journalists in Helsinki likewise held a panel on "Narrative in Science Writing" (Mckenna 2013). Of course as early as 1979 Jean-François Lyotard, in his *Report on the Problems of Knowledge in the Most Developed Industrial Societies, commissioned by the President of the Council of Universities of the Government of Québec* (Lyotard 1979a),

had already emphasized – from the perspective of the philosophy and history of science – that the problem of the position and function of science in the (post-)modern developed societies was one of legitimation, and dealt with it by making the linguistically pragmatic categorical contradistinction between "scientific knowledge" (*savoir scientifique*) and "narrative knowledge" (*savoir narratif*).

An exemplary opportunity to study a blend of scientific and narrative discourse is provided by the case of Goethe's theory of color and its reception. The obvious way to proceed is to compile an inventory of narrative structures and techniques, genres and motifs, in short, narrative elements of any kind, primarily in the *Theory of Colors* of 1810, a two-volume *opus magnum* encompassing more than a thousand pages, for Goethe was already accused during his lifetime of not having been strict enough in keeping science and literature separate (Goethe 1987, 920; Goethe 1991a, 1084-1096; Goethe 1991b, 587-612, spec. 591). From the narratological point of view, however, the *Theory of Colors* of 1810 forms merely an architextual (Genette 1992) nucleus around which further narratives accumulated, whether explanatory or biographical, in Goethe's writings alone. These have then mushroomed during the last two centuries of Goethe reception into a virtually inexhaustible array of superimposed, interpenetrating, and mutually contradictory narratives and metanarratives, to the point where we can now almost speak of a *Theory of Colors* mythos in the sense of a thousandfold rhizomatic cluster of narratives dealing with the phenomena of light, color, and darkness and the various ways they have been explained by Goethe and others. To this is now joined Olaf Müller's own *opus magnum* of more than 500 pages *More Light: Goethe with Newton in the Fight over Colors* (*Mehr Licht. Goethe mit Newton im Streit um die Farben*: Müller 2015).

The methodological prerequisites for any study of texts or discourses from the narratological point of view are a) a transgression and b) a shift in perspective: the transcending of traditional boundary lines between scientific and literary or even philosophical genres, as they are reproduced more or less systematically and consistently in any bookstore or library; and the transfer of attention from the *What?* to the *How?* and *Who to Whom?* of a statement – the question, therefore, regarding the ways facts and ideas are conveyed and what models are used in presenting them when the subject of a declaration addresses a recipient in a linearly verbalized, temporalized form – the form we simply call "narration." Thus, R. H. Brown in his book on scientific narration and civic communication has argued in detail that many self-styled

"scientific" presentations have "narratives of conversion" or “travel stories” as their narrative model (Brown 1998, 64-92).

But other narrative models and genres in scientific texts can readily be appended to Brown's genres of conversion narratives or travelogues: heroic epics of battles, victories, and defeats, stories of epiphany, Grail romances, redemption tales. O. Müller's book – as we will show – is all this in one: the epic tale of a heroic feud with elements and motifs from narratives of conversion, epiphanic accounts, Grail romances, tales of redemption. In addition to this, both the strong starting signal he gives in the very first sentence of the book – "What would have happened if . . ." (Müller 2015, 9) – and the book's sixth chapter, titled "What would be, if? Contrafactual History of Physics" (Müller 2015, 392-409), show that he is actually grazing in the Parnassian fields of poetry, according to that venerable distinction of Aristotle, who says that "a poet's object is not to tell what actually happened but what could and would happen either probably or inevitably” – “ἀλλ' οἷα ἂν γένοιτο καὶ τὰ δυνατὰ κατὰ τὸ εἰκὸς ἢ τὸ ἀναγκαῖον” – and “the real difference is this, that one *[the historian, MB]* tells what happened and the other what might happen.” – “ἀλλὰ τούτῳ διαφέρει, τῷ τὸν μὲν τὰ γενόμενα λέγειν, τὸν δὲ, οἷα ἂν γένοιτο” (Aristotle 1966; Aristotle 1932; 9, 1451a36-1452a9).

Surprisingly, given the voluminous size of the book, which, as the author reveals, would be swollen to twice its size without an editor, Müller completely omits even a passing consideration of the narrative aspects of Goethe's *Theory of Colors*, just as his own vividly colored narrative artistry also escapes his notice. But to stay with the image of the prism, the key object of the book: While Müller's view through the material medium of a glass prism becomes an epiphanic experience that leaves a colorful track of observations and experiments in its wake and generates a half thousand page book, the prism of language as medium of communication – through which a ray of light must also pass in order to be called a "ray" of "light" in the first place – remains, with all the colors of Goethe's highly diverse narration, utterly blank for him, just as the rather shrill coloration of his own narrative remains unreflected upon, and thus unregulated. This is all the more surprising, given that Goethe himself in his Preface to *Theory of Colors* deals with practically nothing but "language" and declares the appropriate verbalization of the phenomena of color, or the extension and enrichment of "these universal designations, this language of nature," as "the chief intent of the present work" (Goethe 1810a, XIII). Goethe's self-declared "chief intent" here as well as his reflection on the connection between speech and color theory is not even deemed worthy of mention, let alone consideration, by Müller.

We may suspect that the author, in the inimitably nonchalant style of his condescending maieutics, would say in objection to this, "All very nice, but not my subject. I deny that . . ." ". . . indifferent to me because irrelevant . . . and whoever praises him on secondary battlegrounds . . . diverts us from the chief concern" (Müller 2015, 39f.). Of course the distinction between a "main" and a "secondary" battleground – to stay with Müller's bellicose language (see below) – cannot be decided by looking through a glass prism; one would have to look through that other prism of *language*, and thus through the historical-philological work on what Goethe has thought, written, and told us, such as those "hosts of Goethe scholars" have been doing for the last two centuries, whose efforts the author sweeps en masse from the battlefield with a sovereign Napoleonic gesture (Müller 2015, 13). He does at least concede that "if Goethe's on the label, he must be inside as well" (Müller 2015, 39). – Then why not take a closer look! This in the light of Lakatos' distinction between a militant and tolerant enlightenment – according to which "Newtonian success . . . turned tolerant enlightenment into militant enlightenment" (Lakatos 1978/89, 201) – and Mandelartz's reference to this distinction with respect to Goethe's views (Mandelartz 2005, 9, 13). Thus we shall argue that Müller not only suppresses Goethe's explicit intentions and completely ignores his place in what in any case is a different scientific culture than his (Müller's) own or Newton's, namely a premodern culture of "narrative knowledge" in the sense specified by Lyotard (see below). More than this, he entangles himself in the paradox of wanting on the one hand to back up Goethe on the level of fact when the latter opposes the militant self-righteousness of the Newtonian school, but doing so on the other hand by constructing an epic-heroic narrative of Newtonian militance, not to say unparalleled eristic belligerence, that extends to choice of words and style of communication. Thus, we are dealing with one of those cases where, as Paul de Man puts it, a multidimensional critical reading on the semiological as well as *rhetorical* (narrative, figurative) levels shows "that the text does not practice what it preaches" (de Man 1979, 15).

Narrating Nature – Narrative Knowledge – Goethe

"Narrating nature" can be understood grammatically in two ways. In one case, it is nature that narrates: " . . . and from the lightest breath to the wildest din, from the simplest sound to the highest harmony, from the most vehement and impassioned cry to the gentlest word of reason it is still Nature that speaks . . ." (Goethe 1840, XVIII; 1810a, X f.). In the other, it is the scientist who (re-)narrates nature, here the nature of colors, and integrates his account into the "grand

récit" of narrating nature: " . . . to apply this language of nature also to the theory of colors, to enrich and extend this language through the theory of colors, through the great diversity of their appearances, and so to facilitate the communication of higher views [*Anschauungen*] among the friends of nature, *[this]* was the chief intent of the present work . . . " (Goethe 1810a, XIII).

Just a cursory leafing through the *Theory of Colors* of 1810 shows that Goethe employs a multiplicity of narrative genres and registers to describe the phenomena of light, darkness, and color in their various relationships. Thus the three main "parts" (*Teile*) – Didactic Part, Polemical Part, Historical Part – are embedded in a narrative framework by a Foreword or Preface (*Vorwort*), an Introduction (*Einleitung*), and an Announcement and Overview (*Anzeige und Übersicht*). This narrative framework ties the factual scientific discussions of light, darkness, and color to Goethe's own biography and intellectual development, to those "fragments of a great confession," as he characterizes his oeuvre as a whole in *Poetry and Truth* (Goethe 1812, 166). The expression "confession" occurs also – no doubt surprisingly for readers of scientific works today – at the end of the Historical Part of the *Theory of Colors* in the title "Author's Confession" (*Confession des Verfassers*) (Goethe 1810b, 666-692; Goethe Wörterbuch 1978ff., lemma "Confession"). It means three things here: a) the linking and embedding of Goethe's own personal history with color into the general history of colors; b) the reflexive positioning of his own approach; and c) the presenting of his own report card to the public – and not just to the scientific community, but a "public community." "Confession" also entails the aspect of *legitimation*, with respect to what others have already thought about color, with respect to himself, with respect to his contemporaries and posterity. Goethe explicitly declares this concluding chapter a part of a larger whole and classifies it as a confession narrative, one that is both personal and also part of the Augustinian tradition: "What my experience in this matter has been in its entirety could only be related in a cumbersome narrative, so let the present account be viewed as merely a chapter of that larger confession which I might still have time and courage enough to make" (Goethe 1810b, 667).

The main scientific divisions also follow narrative models, though to variously marked degrees. The word *didactic* in the title of the Didactic Part – which seems unusual at first glance since, according to its content, the section is concerned with a descriptive and systematizing presentation of the multiplicity of color phenomena – indicates that the author will not simply arrange and classify natural phenomena as such, but, in the manner of a διδακτική τέχνη, a didactic method, invite the reader to walk a path of cumulative understanding, advancing with

him in knowledge through a process of shared perception, observation, and experimentation, with the goal of acquiring an encyclopedic knowledge of color, in the sense of the original ἐγκύκλιος παιδεία (Ritter et alii 1971ff., 2, 575-577). This sentence may serve as an example: "We wish to contemplate familiar elements of the visible world as we go along and note how the organ [the eye, MB] behaves with respect to them, and to this end we adduce the simplest images" (Goethe 1810a, 5). The author indicates the situative creation of a continually advancing path of instruction by setting up a narrative preceptor figure paired with an implicit "naratee" (Prince 1982) / "narrataire" (Barthes 1966), the two together comprising a teaching/learning collective in the "we". The expression "as we go along" sequentializes the procedure that begins with the "simplest images" and lends it a temporally linear path-structure. These elements – constitution of a "narrator" and "narratee," collectivization, linearity, temporalization - are considered the constitutive characteristics of narrativity (Lyotard 1979a; Brown 1998; Nünning 2012).

Embedded in such a narrative structure, other genres can then be called upon to vividly describe a color phenomenon in a stylistically informal way. An example is this biographically anecdotal passage:

> I found myself toward evening in a blacksmith's shop just as the glowing mass was being brought under the hammer. I had looked intensely at it, turned around, and happened to glance into an open coal shed. A huge purple image floated before my eyes, and when I moved my gaze from the dark opening to the bright wooden boards of the shed, the phenomenon appeared to me half green, half purple, according to whether it had the darker or the brighter ground behind it. I did not at that time notice the fading of this appearance. (Goethe 1810a, 17)

Or, again in the Preface, Goethe resorts to the tradition-rich genre of the parable to grotesquely and satirically allegorize Newton's theory of optics as a dilapidated castle with countless added chambers that has "grown long in the tooth" after many vendettas, yet still thinks itself a maiden and is visited by pilgrims. The transposition of a science-historical appraisal into a parabolically caricaturistic narrative is justified with an instance of ironic-satirical, i.e. aesthetic-apologetic distancing: "Since, however, the second part of our work [he means the polemic argument against Newtonian optics, MB] may appear somewhat dry in its content and perhaps too vehement and passionate in its delivery, the reader will allow us an amusing parable as a prelude to that more serious matter and as a sort of apology for the vigorous treatment alluded to" (Goethe 1810a, XV f.). This ruined-castle allegory also takes on a certain shibboleth character, for it appears

repeatedly, as in the Polemical Part (Goethe 1810a, 433), or in a letter to Johann Friedrich Reichardt of 17.11.1791.

In the second, Polemical Part, Goethe switches to an entirely different register than in the first, but it still remains narrative. The title "Exposure of Newton's Theory" refers to concealed, inadmissible doings that are to be uncovered, investigated, and convicted of illegitimacy. This is the narrative of the juridical sphere – with echoes of theological-canonical disputation (Goethe 1991a, 1187; Duck et al. 2016, vii-xxviii). In fact, this part of the work is loosely modeled on the classical rhetoric of the *genus iuridicale* with elements of *narratio*, *confirmatio*, and *refutatio.* And in certain passages Goethe falls explicitly into the role of the prosecutor, as in the following: "This is one of those pernicious lawyers' tricks *(Advocatenstreiche)* that are so characteristic of Newton's optics" (Goethe 1810a, 421). Or: ". . . and the world, which has been parroting his theory for a hundred years, is not only unaware of the sleight-of-hand *(Taschenspielerstreich)*, but hunts down and manhandles those who intend to bring it to light" (Goethe 1810a, 421). He speaks of "torture" and "inquisition" in the matter of the key experiment, the so-called *experimentum crucis*: "But nature is like a staunch and noble-minded person who stands by the truth even under all manner of torture. If the record reads otherwise, either the inquisitor has misheard, or the scribe falsely written. And if such foisted testimony is subsequently regarded as true for a little while, yet someone will eventually take the part of the aggrieved ingénue, as we have done in thus donning our armor to do knightly service to our dear lady" (Goethe 1810a, 423). In the middle of his work on the Polemical Part Goethe also writes to Voigt on 26.9.1809: " . . . essentially from youth on I've been more familiar with jurisprudence than with color science" (Goethe 1991a, 1188). Delegitimation is the *primum movens* of the Polemical Part, the delegitimation as much of Newton's method as of his conclusions.

As to the final, Historical Part, Goethe postulates the fundamentally narrative character of science in general: " . . . that the history of science is science itself . . . We cannot gain a full recognition of what we possess until we have learned to recognize what others before us have possessed" (Goethe 1810a, XX). But at the same time he emphasizes the section's necessarily fragmentary character and therefore relies on the narratological genre of the loosely sequential, chronologically linearized *vita*: "For at the end of the day it is always the solitary individual who stands head and breast against a broader nature and a broader tradition. The struggle of the individual with immediate experience and mediate tradition is in reality the history of science" (Goethe 1810b, 135f.). And: "Therefore, what we gathered and put together remained all too

much of a piecework for us to be able to work it up into a historical narrative, and in any case the leisure has not been granted to us of late. We therefore decided to arrange the whole as a set of basic materials connected to some degree only by position and interspersed observations" (Goethe 1991a, 1050).

Goethe makes a brief summary of his goals in an early draft of an introduction (probably from 1799): (1) "The science of color should be removed from the narrow confines in which it has, for various reasons, been contained up to the present time and brought into the open terrain of observation and contemplation, from a scattered to a unified state." (2) "Since it has stood isolated and closed off within itself in the broad field of natural science, it should be made a link in the great chain of natural forces." (3) "It should be connected with the activity of art and technology." (Goethe 1991b, 209; 398) The Introduction of 1810 extends the connection further to the activities of philosophers, physicians, physicists (with reservations), chemists, mathematicians (with dread), technicians, dyers, manufacturers, and painters (Goethe 1810a, XLIV-XLVIII).

Putting this all together, we can place Goethe's *Theory of Colors* narratively under the rubrics of the (a) *connectivity* (narrating/narrated nature; science of color/natural science; constitution of a collectively knowing "we"), (b) *legitimation* (Didactic and Historic Part) and the c) delegitimation (Polemical Part, Newton) of knowledge. Under these aspects, Goethe's *Theory of Colors* represents an almost textbook example of what Lyotard came to understand as "narrative knowledge," which he set over against modern scientific knowledge as a premodern type of knowledge (Lyotard 1979a; 1979b; 1984). The advantage of Lyotard's approach lies in the fact that he starts with a broad concept of knowledge that is not predefined exclusively from the perspective of (modern) science, but rather includes the latter merely as a subset (Lyotard 1979b, 36; 1984:18). Under ‘knowledge’, then, Lyotard does not simply understand an ensemble of denotative statements to be judged solely according to the ‘true’/‘false’ criterion in the framework of a language game among experts that has been regulated with normative precision. Instead ideas such as *savoir-faire*, *savoir-vivre*, and *savoir-écouter* blend into the concept *savoir*, with the corresponding criteria of usefulness, of justice and/or happiness (ethical sagacity), and of audial or visual beauty (Lyotard 1979b, 36f.; 1984, 18f.). It rests not merely on cognitive skills to the strict exclusion of others, but allows for the activity of various discursive functions: those of cognition, decision, evaluation, reformulation (*à connaître, à décider, à évaluer, à transformer*). The result is that this knowledge coincides with a "formation“ – in the original typescript of the

report for the Council of the Universities of Quebec, Lyotard explicitly added in parentheses "(German Bildung)“, with the word *Bildung* underlined; in the book text the parenthetical reference is omitted (Lyotard 1979b: 36f.; Lyotard 1984: 18f.). As all observers, according to Lyotard, agree, this form of traditional knowledge articulates itself chiefly through use of the "account“, the narrative form, so that we can speak of a veritable "narrative knowledge“ as an entirely specific knowledge-culture (Lyotard 1979b, 38; 1984, 19). It is evident from a culture-historical perspective that "narrative knowledge“ belongs more properly to premodern societies. But at the same time Lyotard emphasizes that even modern, purely scientific knowledge requires narrative, and thus he speaks of a "return of the narrative in the non-narrative“ (Lyotard 1979b: 49; Lyotard 1984: 27). Scientific knowledge, he says, is in fact dependent, for its social legitimation and for its basis in what he calls "the social bond,“ on narrative knowledge or more specifically its structures of expression (Lyotard 1984, 29). How does Müller's book appear in this light?

The Epic Tale of a Presumed Heroic Feud – Müller

The German title *Mehr Licht – Goethe mit Newton im Streit um die Farben* (literally *More Light – Goethe with Newton in the Fight over Colors*) clearly sets the narrative signals: *Mehr Licht*: the pathos of Goethe's reputed last words as his legacy and simultaneous commission to the author of the book, and, as motto of the Enlightenment, also an epochal promise which the author is to redeem. Then *Streit* [here translated as 'fight' as the best English word to convey a similar range of meanings]: according to the Duden Lexicon: "1. vehement argument, quarrel [with a personal opponent] often with agitated utterances, with heated exchanges, also often with physical violence; 2. (obsolete) armed clash, battle." To do justice to the exact German meaning of the word *Streit* the author must accordingly render a fictional service, namely the resuscitation of Newton, who by the time the *Theory of Colors* was published had been dead for 83 years, and his encounter with Goethe. But the narrative "emplotment" (Hayden White 1973) of the scientific questions surrounding the connections of light, colors, and darkness into the heroic epic of a personalized duel is not merely confined to the title. The Introduction takes it up and further casts it into the concrete (if tabloidesque) dramatic form of a tale of heroes:

> This book deals with colors, brightness, and darkness. It has two heroes: Newton and Goethe. As we know, the two are as compatible as fire and water. That is a mistake. In the struggle between fire and water only one of the elements can win – but I would like to

> show that my two heroes are both genuine winner-takes-all types. And winner-takes-all types do not let themselves be overpowered by their opponent. / But winners also make no rotten compromises . . . This conflict must go to the limit, and with the help of the sharpest weapons they have at their disposal. / The sharpness of my two heroes' weapons has been dramatically underestimated by almost all spectators of the battle. (Müller 2015, 27)

Admittedly the author drops the dramatic language and disarms the opponents somewhat in the next sentence: "Less militaristically expressed: Newton and Goethe argue with keener intelligence [*scharfsinniger*] than has so far been appreciated" (Müller 2015, 27). Only to turn bellicose again in the very next sentence: "What are the weapons with which both my heroes battle to no conclusion?" (Müller 2015, 28). With this exposition Müller constructs the narrative scenario of a heroic feud of epic length that has something phantasmic about it on the one hand and spirits away everything historical on the other, or, more accurately, transports it to a transhistorical space: One of the heroes, Newton, fights with an as yet unborn opponent, while the other, Goethe, fights with a revenant. The question that imposes itself with this restoration of Newton's ghost as Goethe's contemporaneous sparring partner – with Müller as the referee and the virtual translocation of the light and color theory to Caesar's Palace in Las Vegas or the sawdust circle of Swiss wrestlers in the Alps – the question that imposes itself here is the question as to the case itself: What happens to Goethe's color theory when it is thus conceived as a battle narrative? The question becomes all the more significant in that the frame narrative of the genesis of Müller's book is likewise a heroic account with motifs from diverse narrative genres, it too *modo molto bellicoso* and decidedly "implacable" (Müller 2015, 425-439), confrontative therefore – this in lively contrast to Goethe's integrative "Confession," conceived along the lines of Lyotard's "social bond."

Inspired by and based on Goethe's satirical ruined-castle parable, the chivalrous *âventiure* of Müller's book can be summarized briefly as follows: The young author as hero, on his journey from rags to riches, from bicycle courier to professor in Berlin, must battle quixotically past windmills and sacks of flour through the established academic powers of philosophical faculties and bite into the sour apple of what to him is a deeply repugnant philosophical-*historical* subject; but he dupes the established powers, because they are so easy to predict, by getting them to agree to "Goethe" as his subject – "the committee snapped at the historical bait" (Müller 2015, 14) – this Goethe, whose claims to science, *en passant*, he intends finally and definitively to dispense with ("in order . . . to finish him off once and for all": Müller 2015, 11). Then, on the Baltic coast

of Poland, he has the eureka experience of a prismatic epiphany and, via this road-to-Damascus visitation, morphes from Saul to Paul (whose own conversion was of course likewise triggered by flash of light: Acts 9.3): "I looked (guided by Goethe) through the prism, suddenly something clicked, and everything was clear" (Müller 2015, 13) [this, incidentally, a probably unintentional mimicry of Goethe's own epiphany: " . . . when it occurred to me that I wanted to take a quick look through a prism . . . But how surprised I was . . and I immediately said aloud to myself, as if by instinct, that the Newtonian theory is wrong" (Goethe, 1810b, 667f.)]. As convert, Müller immediately sets himself up as a passionate advocate for Goethe (obviously no rare model of behavior in the history of religion), a Goethe who himself was without the exact knowledge now possessed by Müller, who for his part "takes the best from them [Goethe's "declarations and chess moves" MB], and precisely where Goethe was trying to get at something – yet could get no further with it" (Müller 2015, 39) – constructs from pieced-together textual passages a "theorem of Goethe's," which the latter never really formulates as such (also a familiar element in the history of religion). He then summons his Herculean mental powers to battle the Lernaean serpent in the form of all previous Goethe scholarship ("I propose to shelve two hundred years of misguided reception": Müller 2015, 39) and the whole course of science since Newton in general (*"Possibly our physics today would look completely different* [italics Müller]": Müller 2015, 9) and goes forth into the world like the apostle Paul, preaching the New Doxa, which is dyed in his own wool but goes under the iconic label of "Goethe": Goethe the annointed Quinean *ante diem*, redeemed in grail of the Underdetermination Theory: ". . . will constantly be apparent how aptly we may interpret Goethe as the champion of Quine's Underdetermination Thesis. Even more, Quine's thesis gains contour and plausibility with Goethe's help" (Müller 2015, 334).

But the confrontative battle narrative in both the frame story and the main account is not merely confined to emplotment: it dominates communication style and word choice as well. Besides the already mentioned "heroes," "winner-takes-all types," "hosts," and "secondary battlegrounds," the phrase "sharp weapons" appears repeatedly (10x), and "sharp" in its various forms as adjective, verb, and substantive a total of 50x – crossing the border into the unintentionally comic in view of the double meaning of German *scharf* ("sharp" in the sense also of "hot, sexually attractive") in the howler "Goethe as sharp as Newton" (427). But there are also occasional "hidden explosives" (29), as well as "tour de force" (33); a comparison of counterfactual military with scientific history "covers . . . a wide field by forced gallop [*Gewaltritt*]" (404); the question "Was Goethe a wimp [*Weichei*]?" (426) is posed in the

swaggering vein of teenage slang, and there are also "special offers for wimps" (426). Goethe's and Newton's statements are "chess moves" (11x, of which 4x in the set phrase "declarations and chess moves"); one can or cannot be "pushed around" *[herumschubsen]* (420, 422) by observations or experiment results as in a schoolyard scuffle; or with verbal aggression one can be "damned right" (19). A special case, for English translation too, is the techno-idiosyncratic use of *Stellschraube.* Since the German word (English "adjusting screw, regulating screw, set screw": Pons 2016) appears a full 49x in Müller's book, including the compounds "data set-screw," "theory set-screw," and even "virtue set-screw" *(Tugend-Stellschraube)* (10x!), the expression must be given some terminological weight – but unfortunately the author nowhere says what a set-screw is in professional-philosophical newspeak.

Obviously such a style is part of a narrative strategy that seeks intimacy with the readership and does not shrink from corny humor like a *Rudolf Steiner des Anstosses* [Rodolphe Stoner of contention] (Müller 2015, 14), *maxfrische Ansprüche* [Max Frisch-type demands] (Müller 2015, 20), and *ritterlicher Generalangriff* ["chivalrous general assault" – in reference to the German scientist J. W. Ritter] (Müller 2015, 441). But to what purpose? To chum up – but with whom? Those who most certainly will never touch a voluminous book like this one on Goethe's and Newton's ideas of the nature of light? But perhaps it is also testimony to the fact that what Kaehlbrandt has recently diagnosed as the "loosey-goosey German" (*Lockerdeutsch*) of the "hello society" (*Hallogesellschaft*) has invaded even science-philosophical discourse (Kaehlbrandt 2016, 129-144). Clearly the "social bond" that Lyotard declares necessary for the legitimation of scientific knowledge and that Goethe achieves with the unpretentious sentence cited above – "We wish to contemplate familiar elements of the visible world as we go along . . . and to this end we adduce the simplest images" – is not established by Müller's communication style. There is, admittedly, paternal reassurance: "Don't worry, you don't need any special knowledge of physics to understand the experiments" (Müller 2015, 28). And we hear turns of phrase typical of German professors at the lectern: "I expect you to" (or not to), "I spare you," "I show you," "recommend," "report," "present to you," etc. But when it comes to the explanation and proof of Goethe's centerpiece theorem (as constructed by Müller and oddly enough stashed away in an "Appendix"), we suddenly find ourselves confronted with an arcane, formulaic hermetism of theoretical jargon (Müller 2015, 209-2016). Bonding didactics or condescending hyper-didactics – that is the question!

“More light!” or “more light?” – the Paradox of narratively reversing tolerant Enlightenment into militant Enlightenment

We have already floated the question: What happens to Goethe's color theory as a whole when it is so decidedly “sharpened” into the battle-narrative of a fight between Goethe and Newton? When both are constructed as "genuine winner-takes-all types" who "do not let themselves be overpowered by their opponent" and make no "rotten compromises"? Or put differently: What must the narrator do to get his narrative to work? Or more precisely: What "chess moves" has the course of Müller's narrative left him for making the already mentioned recasting of Goethe as Quinean *ante diem* and representative of the Underdetermination Theorem seem at all plausible?

In short: the sleight-of-hand techniques familiar to every textual scholar versed in critical theory: a) textual omissions, b) *petitio principii*, c) a short-circuited *hermeneutic circle*, d) linguistic conversion of assumptions into certainties, and e) a terminological shift that contorts Goethe's argument with Newton into a fundamental struggle of worldviews: freedom versus the tyranny of nature and its laws.

Müller confirms the use of (a) the *omissions technique* himself: Since his concern is "with the physics of light, colors, and darkness," he can "bracket all of Goethe's declarations and chess moves that have little to do with it" (Müller 2015, 39). There is also a "second area of Goethe's work" that he is forced to "let fall from the table," namely "central aspects of Goethe's own explanation of the colors of the spectrum": "In this explanation the colors are supposed to emerge somehow from the interplay of light and darkness. But how? That I do not understand, and I harbor the suspicion that it is not capable of being understood at all; Goethe's text, otherwise so clear, is murky at precisely this juncture" (Müller 2015, 40). Quantitatively speaking, this means the "bracketing" and "falling-under-the-table" of almost 1000 of the 1400 pages in the first edition of 1810, approximately seventy percent, in other words. In terms of content it comprises – with the exception of the delegitimation of Newton – everything that Lyotard characterizes as Narrative Knowledge: the connectivity of various spheres of life and knowledge, as well as the historical, social, and individual legitimation of Goethe's thought and investigations with respect to light, darkness, and color. Müller's justification for this we are already familiar with from excerpts cited *supra*: "All very nice, but not my subject." So far there is nothing to object to; everyone has the right to limit his subject as he pleases. But it is a different matter when this "justification" continues: "I deny that they are his [Goethe's] sole and most important strengths. They are indifferent to me, because irrelevant to the fight with Newton. Goethe wanted to win

this fight first and foremost, and whoever praises him instead on secondary battlegrounds like aesthetics or medicine, diverts us from the chief concern" (Müller 2015, 39f.). A classic *petitio principii* for the eristic battle narrative! Why Goethe might have written the other thousand pages Müller never tells us. This *petitio principii* (b) is supplemented by (c) a likewise classic short-circuited *hermeneutic circle*: "First, my reconstruction of the theory of colors is a perfect fit with many of Goethe's declarations and chess moves, which would otherwise stand juxtaposed without connection. Second, it strengthens these declarations and chess moves" (Müller 2015, 39). Both procedures, *petitio principii* and the short-circuited *hermeneutic circle*, have long been familiar to a critical history of religion or ideas in their disputes with ortho- and other doxies. Müller's circular battle narrative has such power of self-conviction that he feels no qualms about overstepping the iron barriers of the German language with respect to the modality of verbs. Thus in connection with "Goethe's Theorem" he sufficiently betrays himself with the use of the indicative (d): "With probability bordering on certainty, Goethe *regarded* [sic! italics MB] a similar proposition as correct, but was not able to prove it and probably didn't even want to" (Müller 2015, 209). Whether more or less "similar" or "probable," and whether willed or not, Goethe *did* not, nor *was* he not able or willing – unless Müller can prove this in black and white – but rather *would have* done, been able, or wanted these things in the subjunctive mood. Aristotle waves from the distance.

That Müller does not go into what Goethe himself in 1810 explicitly declared to be the "chief intent" of his color theory has already been noted. But his readership also fails to learn that Goethe himself regarded precisely that Polemical Part of the *Theory of Colors* – which contains what Müller calls the "chief concern," fighting with and victory over Newton – as dispensable. Here is Goethe in conversation with Eckermann on the 15th of May 1831 concerning the definitive edition: “The case may arise . . . that the publisher is unwilling to go beyond a certain number of sheets, and that hence some part of the material must be omitted. In that case, you may omit the polemic part of my ‘Theory of Colours.’" (Eckermann 1850, II, 393f.; Eckermann 1836, 2, 342) – Which actually occurred in the edition of 1833 (Goethe 1991a, 1189). Goethe's justification: "My peculiar doctrine is contained in the theoretical part; and as the historical part is already of a polemic character, inasmuch as the leading errors of the Newtonian theory are discussed there, you will almost have polemics enough. I by no means disavow my severe dissection of the Newtonian propositions; it was necessary at the time, and will also have its value hereafter; but, at bottom, all polemic action is repugnant to my proper nature, and I can take but little pleasure in

it" (ibid.). – *"I take but little pleasure in it"* might also hold for a book that measures all Goethe's efforts with respect to light, colors, and darkness with the single yardstick of a "fight" with Newton.

This does not at all mean that Goethe should be characterized *partout* as an irenic, nor – as he says himself – should his yearslong vexation, his astute (*scharfsinnig*) attempts at rebuttal, or his experiments be "disavowed." His selective perception and mythicization to which Müller in Part III offers fascinating insights, as well as his famous remarks to Eckermann and Frédéric Soret, may likewise stand in full – as long as we keep in mind the situative context: that both were instances of an old man holding forth to younger admirers after a good meal, where like many others even a Goethe might fall to bragging: ". . . that I, amongst millions, am the only one who knows the truth on this important subject" and Soret's observation: "While Goethe spoke thus, with such a force and a fluency of expression as I have not the power to reproduce with perfect truth, his eyes sparkled with unusual fire; an expression of triumph was observable in them; whilst an ironical smile played upon his lips" [30.12.1823] (Eckermann 1850, I, 109f.; Eckermann 1836/48, 3, 29f.). Likewise the even more famous report by Eckermann (cited by Müller): " 'As for what I have done as a poet,' he would repeatedly say to me, 'I take no pride in it whatever. Excellent poets have lived at the same time with myself, poets more excellent have lived before me, and others will come after me. But that in my century I am the only person who knows the truth in the difficult science of colours – of that, I say, I am not a little proud, and here I have a consciousness of a superiority to many' " [19 February 1829] (Eckermann 1850, II, 145; Eckermann 1836/48, 2, 86f.).

Meanwhile a rough semantic field analysis of the word "fight" (*Streit*) in the context of *Theory of Colors* shows that Goethe uses it a) differentially, b) specifically, and c) with self-distancing apology. Thus he differentiates *Kampf* ("clash, struggle, battle") and *Streit* ("fight, argument, conflict," et al. [see likewise Duden on modern usage *supra*]) along the axis of *tradition* and *present*: "We are constantly in a struggle [*Kampf*] with tradition, and the claim that we should take the empirical knowledge of the present age on its own authority likewise demands that we engage in a serious fight [*Streit*]" (Goethe 1810b, 135). Accordingly the word in its 37 occurrences is never used with regard to Newton personally, but is always specifically applied to the "Newtonian theory" (Goethe 1810a, 404, 429; Goethe 1810b, 484, 710f.), the "Newtonian school" (Goethe 1810a, 359), the "Newtonian party" (Goethe 1810a, 648f.). In the Preface Goethe expressly rejects the idea that he is talking about a "dubious feud" (Goethe 1810a, XVIII) and says in the

Introduction: "We do not press this mode of stating the subject on any one. Those who, like ourselves, find it convenient, will readily adopt it; but we have no desire to enter the lists hereafter in its defence [*sie künftig durch Kampf und Streit zu verteidigen*]. From time immemorial it has been dangerous to treat of colour; so much so, that one of our predecessors ventured on a certain occasion to say, 'The ox becomes furious if a red cloth is shown to him; but the philosopher, [to whom one] speaks of colour only in a general way, begins to rave'" (Goethe 1840, XL; 1810a, XXXIX f.). In the Historical Part, he personally-ironically apologizes to "Newton's manes": "And if in our fight [*Streit*] against the Newtonian theory we have sometimes lost our composure, we transfer all the blame to the school, whose delight in persecution stands in full proportion to its ire" (Goethe 1810b, 483f.). At the conclusion of the Polemical Part Goethe makes an actual apology, in which he explicitly connects its eristic spirit sociopsychologically with the belligerent turmoil at the time *Theory of Colors* was being written:

> In particular we would perhaps soften a few vehement expressions which infuriate the opponent, are annoying to the impartial reader, and which friends, at the least, must pardon. But we are minded, to our reassurance, that this whole work was undertaken and completed amid the ferocious war that convulsed our fatherland. The violence of the time penetrates even to the peaceful dwellings of the Muses, and men's morals, if not determined, are yet modified by examples close at hand . . . Hardly any party in the history of the sciences has proved more obstinate than the Newtonian . . . it has robbed me too of a happier and more advantageous use of several years. May people pardon me then if I have said all kinds of nasty things about the party and its author. I hope that it may turn out to the good of our descendents. (Goethe 1810a, 648)

And indeed in the following historical section with its distancing long view, historical justice is sought even for the Newtonian school: "Through this more is achieved than through all polemic [!! MB]; in this way the author [Newton], his disciples, and the compliant and insistent century are not so much indicted as pardoned. To this milder treatment therefore, which is required for the completion and conclusion of the whole, we herewith invite our readers and hope that they may be attended by good will and an open mind" (Goethe 1810a, 649). *"Good will and an open mind"* – this concluding phrase and the cited passage as a whole not only testify to Goethe's place in what Lakatos has termed the "tolerant Enlightenment," they also show that the battle din about Goethe as an uncompromisingly "genuine winner-takes-all type" does not stand up to serious philological work.

The dramatized prelude at the beginning of his book's battle narrative compels Müller to conclude with at least as dramatic a finale. And indeed the tale steers toward nothing less than a

clash, not of civilizations admittedly, but still one of irreconcilable "worldviews" (*Weltanschauungen*), namely Freedom vs. Tyranny. A lengthy reflection by Goethe in the Preface to *Theory of Colors*, one which, before him (Müller) – "as a matter of course," we are tempted to say at this point – "not one Goethe critic . . . has taken seriously" (Müller 2015, 418), serves as his point of departure. In it Goethe firmly opposes a stripped-down empiricism which holds that "experience should be presented without any theoretical bond," insisting by contrast "that with every attentive look at the world we are already theorizing," but that it is necessary "to carry it out with awareness, with self-knowledge, with freedom, and . . . with irony"; and for this, in turn, "a certain dexterity is needed, if the abstraction we fear is to be rendered innocuous and the results we hope for from experience are to become truly vital and useful" (Goethe 1810a, XIVf.). The very first scent Müller picks up – he interprets the quoted passage as expressing "a healthy empiricism" which has "clearly" realized "that all observation is laden with theory at least in its fundamental features" (Müller 2015, 417) – was bound to lead him astray, since Goethe by no means speaks of observation being "laden" with theory in the sense of a cognitive handicap or a deficit that neglects or falsifies reality. Theory for him has the Platonic-Plotinic sense of θεωρία as contemplative gaze, i.e. an essential *unity* of seeing and seen, of eye and light; the corresponding citation from Plotinus' *Enneads* (I, 6, 9) follows promptly less than ten pages into the Introduction (Goethe 1810a, XXXVIII). But where Müller is primarily heading is toward the catchword "freedom." This is the word he has picked out of the complex texture of the passage without further contextual consideration of its place in the ensemble. The "bold word" *irony* he immediately drops, perhaps because it could hardly please the "analytically schooled philosopher of science," so likewise with "dexterity" (*Gewandheit*) and the final statement of purpose: "if the abstraction we fear is to be rendered innocuous . . ." Instead Müller hails us with the bold and pithy slogan: "Goethe offers us freedom instead of tyranny" (Müller 2015, 417). Without pausing for the slightest breath and asking in the light of a historical semantics what the term *freedom* might have meant to Goethe in connection with science as a whole and seeking further evidence for a deeper analysis of the term (something students learn in any first semester course in historical research methods), he takes the term according to his own taste; pairs it, likewise without a hint of reflection, with *Weltanschauung*, itself a highly complex and problematic term in the history of ideas (Ritter et alii 1971ff., 12, 453-460); and defines it as freedom with respect to a suppositious "insuperable, tyrannical power by the name of Nature" and a "science-enslaved worldview" (Müller 2015, 421) that is beholden to this credo. Newton, for his part, "fell victim to

the tyranny" (Müller 2015, 421) or, more precisely, allowed himself – "tragically" – "to be tyrannized by experiments *of his choice* [italics Müller]" (Müller 2015, 422) and "tried with the help of the experiments he had picked to exercise a tyranny over his contemporaries": "A tyrannized tyrant" (Müller 2015, 423), therefore. Opposed to this, there is "something liberating when Goethe calls out to us that maybe we are not under the yoke at all, or at least that we don't have to be" (Müller 2015, 421). And from there the redemptive path of Goethe Hero as Quinean *ante diem* leads – as previously noted – to the Munsalvaesche Castle of the Underdetermination Theorem.

But it is hard to imagine a notion *less* like Goethe than a “tyrannic power by the name of Nature” or a “yoke” of nature or of natural laws – it is found neither in the *Goethe Dictionary* [*Goethe Wörterbuch*] (1978ff., lemma ‘Joch’ [yoke]) nor in any search of the *Works* or of the *Letters, Diaries, and Correspondence* [*Briefe, Tagebücher, Gespräche*] in the Digital Library [Digitale Bibliothek] (Goethe 1999; Goethe 1998), and there is only a single bit of evidence for an association of "nature" with "yoke" or "tyranny": In the letter to Schiller of 10 February 1798 the word "tyrannize" occurs once, but in relation to Newton: ". . . before Newton came upon his hypothesis and *tyrannized* [italics MB] this field with it in a most anti-Baconian manner." Thus Müller's whole idea that Goethe sought a liberation from or with respect to such a yoke or power comes to nothing.

Furthermore, an impartial inspection of Goethe's works, apart from the tunnel vision of Müllers battle narrative (the result of limiting the *Theory of Colors* to a prismatic horizon), shows that Goethe's concept of freedom in connection with science points in a completely different direction from the path taken by Müller, one, namely, that is primarily critical of *institutions* and *methods* rather than *insights* and never at all critical of *nature*. Two illuminating examples of this are 1) the scientific conversation between Montan and the astronomer in *Wilhelm Meister's Journeyman Years*, where the argument enters the area of societal theory and the politics of science, and the principle of scientific freedom is unreservedly postulated; and 2) Goethe's conversation with Soret on 30 December 1823, in which Goethe's argument is more an analysis of the economics of science and the politics of culture.

In the conversation of the journeymen, Goethe starts by clearly distinguishing between the evaluation of traditional scientific knowledge and the testing of "new theories." With the former, the crucial question is whether or not it "has come to a standstill, and thus fosters stagnation

rather than progress" or whether "an assumption has retained its vitality and has influenced and furthered continuing endeavors" (Goethe 1994, 405; Goethe 1989, 727). The question to be asked regarding "newly" touted insights is "[whether] the assumption [is] a real advance or merely obedience to fashion." – "For an opinion presented by energetic men spreads by contagion through the populace, and is then called unassailable – a claim that has no meaning to the true scientist" (Goethe 1994, 405; Goethe 1989, 727). In what follows he discusses the institutions of science, church, and state under the aspects of sovereignty and diverse temporal horizons. He concedes a sovereign claim to both state and church, for these "deal with the recalcitrant masses" in the life of the present "and so long as order is maintained, the means do not matter." But in the sciences, on the other hand, with their prospect of temporally unlimited progress, "the utmost freedom is required, for the scientist works not for today or tomorrow but for an inconceivable progression of ages" (Goethe 1994, 405, 407; Goethe 1989, 727).

In the conversation with Frédéric Soret in 1823, Goethe treats the question of freedom – with an almost actualistic reference to today's conditions – from the perspective of both of a sociology of knowledge and an economics of science. He thereby typologically contrasts the "sphere of Newton," as the exemplary case of a scientific enterprise ultimately steered by economic interests and a mentality of possession, to a "sphere of aesthetics," in which "everything is less grievous; the thoughts are, more or less, an innate property of all mankind with respect to which the only point is the treatment and execution – and, naturally enough, little envy is excited" (Eckermann 1850, I, 107; Eckermann 1836/48, 3, 26). By contrast, scientific questions “are very often questions of existence. A single discovery may make a man renowned, and lay the foundation of his worldly prosperity" (ibid.; Eckermann 1850, I, 108 [Oxenford trans. modified]). Thus there prevails in the sciences a mentality of possession, competition, and jealousy: "Every newly observed phenomenon is a discovery – every discovery a property. But let a single person touch that property, and the man will soon be at hand with all his passions” (ibid.). Likewise “in the sciences, what has been handed down or taught in the academies is also looked upon as property" (ibid.; [trans. Oxenford somewhat modified]).

When Goethe speaks of a "sphere of aesthetics" as the place of freedom, the very expression *“Reich der Aesthetik”* points to his friend Schiller – with whom he exchanged over a thousand letters and had innumerable conversations – and the latter’s philosophy of freedom in *Letters on the Aesthetic Education of Man*. Goethe's reflections on the possessive mentality of individual scientists, but also of academies and institutionalized schools, and the statement "In the sphere of

aesthetics by contrast everything is less grievous; the thoughts are, more or less, an innate property of all mankind" sound like the echo of a sentence in Schiller's 27th letter, which reads: "From within the Mysteries of Science, taste leads knowledge out into the broad daylight of Common Sense, and transforms a monopoly of the Schools into the common possession of Human Society as a whole" (Schiller 1967, 217; Schiller 1795, 122f.). There could hardly be a more succinct and accurate paraphrase of Lyotard's concept of Narrative Knowledge. And where Schiller speaks of the "Mysteries of Science" Goethe speaks to Soret of the "sphinx-like" quality of "isolated manifestations of the laws of nature" (Eckermann 1850, I, 108; Eckermann 1836/48, 3, 26).

Both examples, the one from *Journeyman Years* and the other from the conversation with Soret, show that Goethe's concept of freedom in the Preface to the *Theory of Colors* can be localized, in a way that is fully adequate and unobjectionable from a historical semantics perspective, within the thoughtworld that included Weimar and Jena around 1800 and does not need to be transported to some dubious, but misleading Nephelokokkygia of forerunnership to an as yet unborn Duhem-Quine Underdetermination Theorem. Under these same auspices in the "less grievous sphere of aesthetics," and therefore of an intellectual culture of Narrative Knowledge instead of an eristically possessive scientific mentality, the assimilation of that "bold word" *irony* is utterly seamless, though the "analytically schooled philosopher of science" (who speaks here of "schools"?) bypasses it with uncomprehending irritation – ironically or typically, or both?

(Translation: Robert E. Goodwin, Skidmore College)

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